

## HANDHELD ELECTRIC BEATER/MIXER HAVING A SAFETY DEVICE

The present invention relates to a handheld electric beater-mixer, particularly a kitchen beater-mixer, adapted to drive at least one so-called beating accessory such as for example a whisk or a so-called mixing accessory turning at high speed, such as for example a mixer foot, and comprising a body containing an electric drive motor, two rotatable coupling devices which are connected to the motor shaft and which are adapted to receive, via respectively two engagement passages opening from the body, the beating accessory and respectively the mixing accessory, and a safety device adapted to prevent the simultaneous emplacement of two accessories, respectively for beating and for mixing.

There is meant by beating accessory a working tool of the whisk or blender type, and by mixing accessory an accessory with a working tool turning at high speed of the rotatable helical mixer foot type, or else of the mixer bowl type with a rotating knife.

With such a kitchen appliance, it is known that the presence of a safety device preventing the concomitant emplacement of the two accessories, respectively for beating and mixing, is particularly useful to protect the user from any risk of wounding which would be due to the

two working tools in movement simultaneously if the apparatus were started with the two accessories in place.

In a known kitchen device of this type, the safety device which prevents the simultaneous emplacement of the two accessories, respectively for beating and for mixing, comprises a strap slidably horizontally mounted in the body of the apparatus, of which one end is shaped as a hooked tongue arranged in the engagement passage for the mixing accessory, and whose other end is shaped as a fork with several teeth, which fork is associated with an ejection member displaceable vertically between a low position and a high position under the action of the beating accessory. The fork of the strip is adapted to free the movement of the ejector member so as to permit the emplacement of the beating accessory, the hooking tongue of the strip closing the engagement passage for the mixing accessory; following disengagement of the hooking tongue of the strip under the action of the mixing accessory during its emplacement, the fork of the strip is adapted to block, by one of its teeth, the ejection member in the lower position, thereby preventing the emplacement of the beating accessory. Such a safety device is however complicated and is relatively complicated to use by being subject to the good operation of the ejection member mounted in the apparatus.

The invention has particularly for its object to overcome these drawbacks and to provide a handheld electric beater-mixer, of the type described above, in which the safety device will be simple, economical, reliable and  
5 perfectly adapted to mass production.

According to the invention, the safety device comprises a mechanical member movable so as to block selectively one or the other of the two engagement passages for the beating accessory and for the mixing accessory.

10 Thus, thanks to this selective blocking member acting directly on the two engagement passages, respectively for the beating accessory and for the mixing accessory, it will be understood that the use of the piece is thereafter rendered independent of any movable member belonging to the  
15 apparatus, which permits simplifying the safety device by rendering it particularly reliable.

The characteristics and advantages of the invention will become further apparent from the description which follows, given by way of non-limiting example, with  
20 reference to the accompanying drawings, in which:

- Figure 1 is a fragmentary vertical cross-sectional view of a beater-mixer according to the invention, in the stopped position and in the absence of an accessory;

- Figure 2 is a perspective view, on an enlarged scale, of a safety device for the beater-mixer of Figure 1;

- Figure 3 is a view identical to Figure 1, with the mounting of a beating accessory; and

5        - Figure 4 is a view identical to Figure 1, with the mounting of a mixing accessory.

10        The handheld beater-mixer shown in Figure 1 comprises a body 2 of generally substantially prismatic shape having a recess portion 3 which delimits a handle 4, and containing an electric drive motor 6 provided with a shaft 8 having an axis XX' and disposed, in normal use with at least one so-called beating accessory such as for example a whisk 10 as shown in Figure 3, in the lower portion 12 of the body 2 extending horizontally.

15        In the embodiment shown in Figure 1, the shaft 8 of the drive motor 6 carries at its front end 14 an endless screw (not shown) which coacts with two helicoidal pinions each turning about an axis YY' perpendicular to the axis XX', and which form with the latter a reducer 16. These  
20        two helicoidal pinions are located in the front portion 18 of the body 2 and are connected respectively to two rotatable coupling devices 20 of axis YY', of which only one is visible in Figure 1, which are respectively open facing two openings 22 provided in the lower wall 24 of the

body so as to define two passages 26 opening from the body and adapted for the engagement of two whisks 10 of which only one is shown in Figure 3. Each whisk 10 comprises a cylindrical shaft 28 (Figure 3), with an axis YY', whose  
5 upper end is adapted to be fixed in the corresponding coupling device 20. The two whisks 10 can be fixed in coupling devices 20 either side by side or one behind the other.

In this example, in Figure 1, the shaft 8 of the drive  
10 motor 6 carries at its rear end 31 another rotatable coupling device 33 forming a drive which is disposed in a cylindrical socket 35 extending horizontally in the rear portion 37 of the body 2. In this embodiment, the socket 35 is open facing an opening 39 provided in the rear wall  
15 41 of the body 2 so as to define a passage 43 opening from the body and adapted for the engagement of a mixing accessory turning at high speed such as for example a mixer foot 45 as shown in Figure 4. This mixer foot 45, Figure 4, is adapted to be fixed for example by screwing into the  
20 socket 35 and encloses a shaft 47 whose so-called rear end 48, opposite the blades 49 housing a helix (not shown), is adapted to couple with the drive 33.

In Figure 1, 3 and 4, there is shown at 50 a finger piece mounted in the upper wall 52 of the body 2 and

adapted, in a manner known per se, to actuate a switch (not shown) which places the motor in operation and controls its speed of rotation.

The beater-mixer moreover comprises a safety device, 5 designated generally at 55 in Figures 1 to 4, adapted to prevent the simultaneous emplacement of the whisks 10 and of the mixer foot 45, and which, according to the invention, comprises a movable mechanical member 57 adapted to block selectively one or the other of the passages 26 10 and 43 for engagement of the whisks 10 and, respectively, of the mixer foot 45.

In a preferred embodiment shown in Figures 1, 3 and 4, this mechanical so-called safety member 57 is horizontally slidably mounted within the body 2, adjacent the internal 15 surface 24a of the lower wall 24 of the body, and comprises a horizontal strip 59 whose rear portion carries a finger or lug 61, better shown in Figure 2, projecting into the interior of the socket 35 through a clearance opening 63 provided in the sidewall 65 of the socket 35. As shown in 20 Figure 2, in this example, the forward portion of the strap 59 is shaped like a horizontal plate 67 forming a cover whose front edge 68 is hollowed out with two identical notches 70 associated respectively with the two passages 26 for engagement of the whisks and each having a profile

adapted to that of the shaft 28 (Figure 3) of the whisk 10, as well as a diameter slightly greater than the diameter of the shaft 28 of the whisk.

The safety member 57, Figures 1, 3 and 4, is urged by  
5 a return spring 72, in this instance a compression spring, which is interposed between the lower portion of the finger 61 of the strip 59 and a vertical wing 74 provided on the external surface of the sidewall 65 of the socket 35, adjacent the bottom of the latter.

10 There is shown at 76 in Figures 1, 3 and 4, ribs formed in the body 2 and bracing with slight play the strip 59 of the safety member 57; these ribs 76 ensure guidance of the strips 57 during its sliding.

In the stopped position of the beater-mixer, in the  
15 absence of any accessory, as shown in Figure 1, the safety member 57 occupies a rest position in which the two notches 70 of its cover 67 are aligned with the two openings 22, thereby freeing the two passages 26 for engagement of the whisks, whilst its projecting finger 61 coacts in bearing  
20 with the sidewall 55 of the socket 35, under the action of the compression spring 72.

With reference to Figure 3, the safety member 57 occupies a so-called beeping position which corresponds to its rest position in Figure 1 in which the two passages 26

are freed and hence permit the emplacement of the whisks 10, whilst the passage 43 is obstructed by the finger 61 projecting into the socket 35. The shafts 28 of the whisks 10 thus pass each through its respective opening 22, with slight peripheral play, then through the corresponding notch 70 of the cover 67 of the safety member 57, also with slight peripheral play, to become fixed in the corresponding coupling device 20.

In this beating position shown in Figure 3, if the user introduces the mixer foot 45 through the opening 39, the mixer foot 45 can not substantially move the finger 61, except for the peripheral play existing between the shaft 28 of each whisk 10 and the corresponding notch 70 of the cover 67 of the safety member 57, such that the mixer foot 45 cannot be completely emplaced in the socket 35; it will be understood that a slight displacement of the finger 61 results in the abutment of the bottom of each notch 70 of the cover 67 against the corresponding shaft 28 of the whisk 10, preventing the complete emplacement of the mixer foot 45 and hence its coupling with the drive 33.

From the beating position of Figure 3, the whisks 10 can be freed, in a manner known per se, by an ejection member, shown at 78 in Figure 3, which is adapted to be actuated by the finger piece 50.



With reference to Figure 4, the safety member 57 occupies a so-called mixing position to which it is brought by sliding in the direction of the arrow F in Figure 1, under the action of the emplacement by screwing of the mixer foot 45, thus giving rise to the longitudinal movement of the finger 61 of the member 57 within the socket 35, against the compression spring 72. At the end of the screwing path of the mixer foot 45, as shown in Figure 4, the shaft 47 of the latter is coupled with the drive 33, and the cover 67 of the safety member 57 closes the two openings 22, thereafter preventing the emplacement of the whisks 10.

From the mixing position of Figure 4, the mixer foot 45 can be simply withdrawn by unscrewing, the safety member 57 then returning, under the action of compression spring 72, to its rest position as shown in Figure 1.

As will be seen from the above description, the safety member 57 constitutes a simple mechanical member serving as a selective block which acts directly on the passages 26 and 43 for engagement of the whisks 10 and respectively the mixer foot 45, and this quite independently of any movable member mounted in the apparatus.